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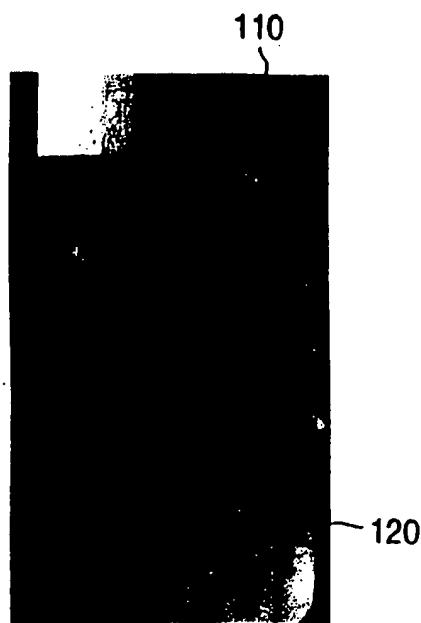


FIG. 1

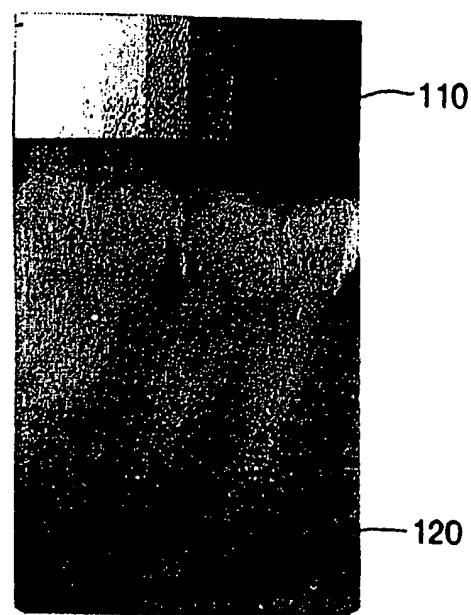


FIG. 2

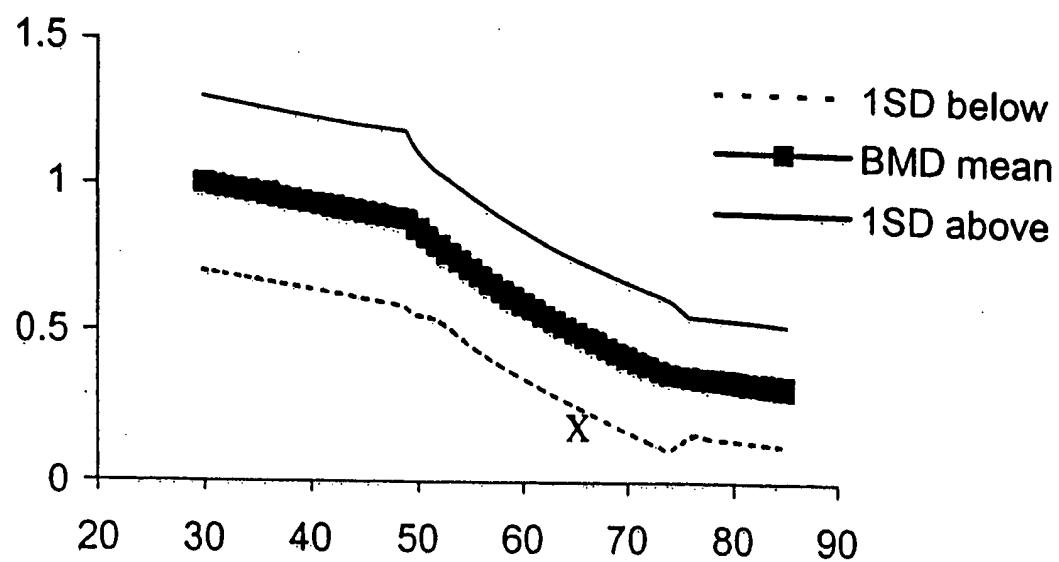
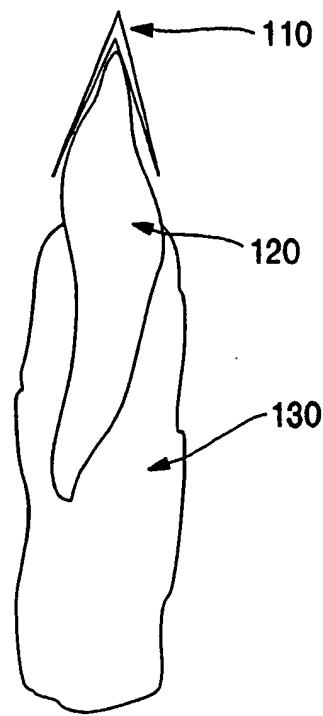
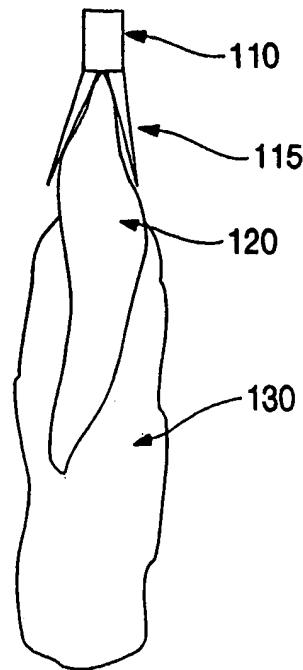


FIG. 3



**FIG. 4**



**FIG. 5**

FIG. 6B

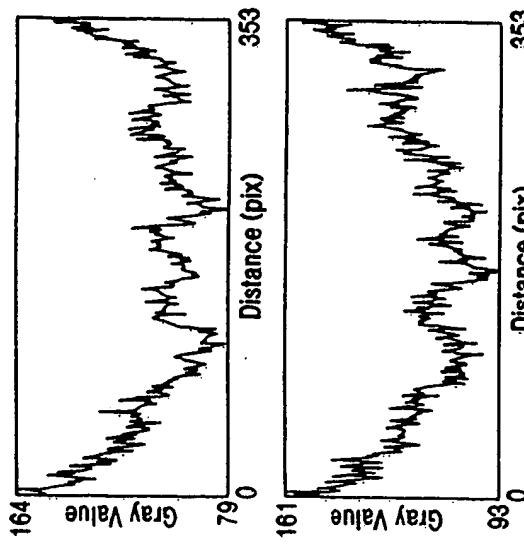


FIG. 6C

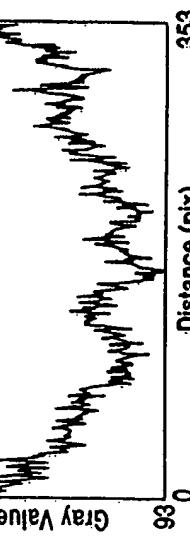


FIG. 6D

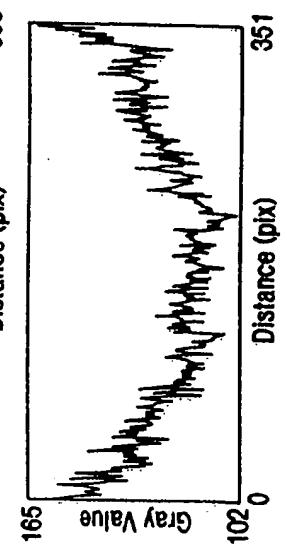


FIG. 6E

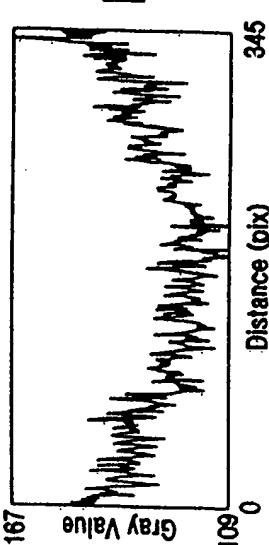
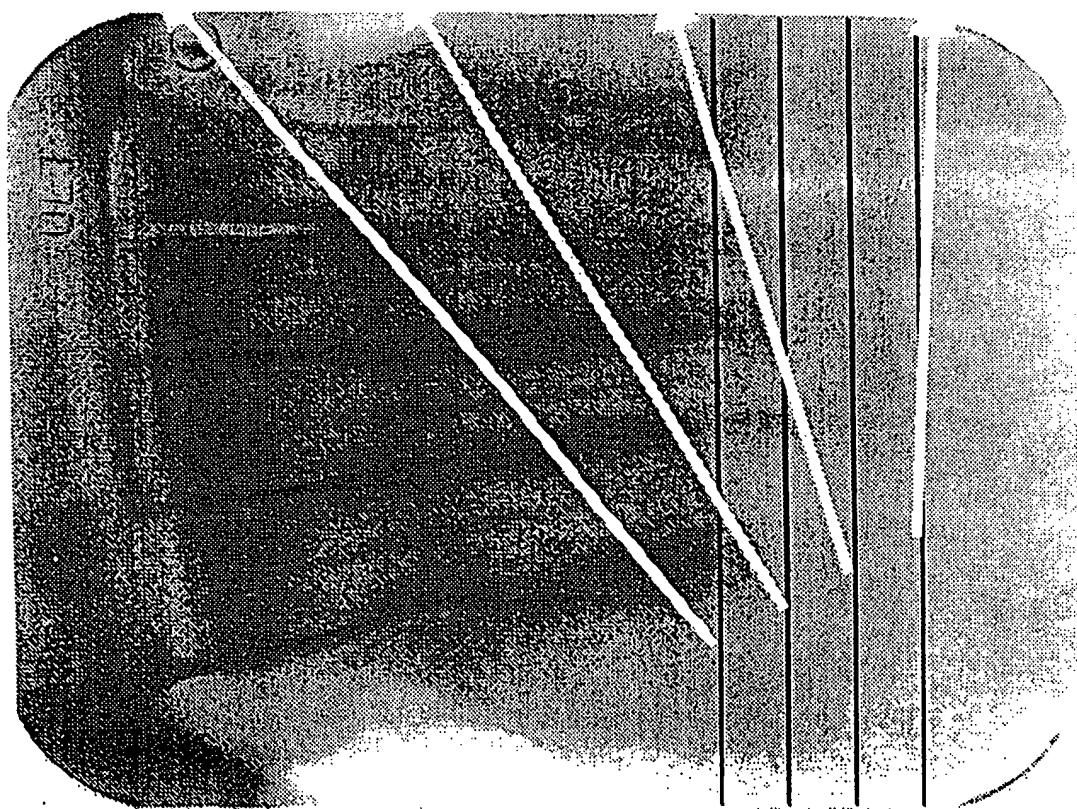
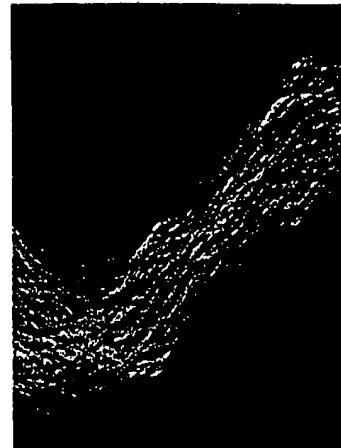
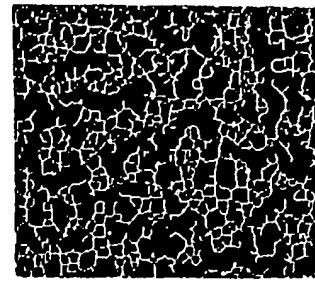


FIG. 6A

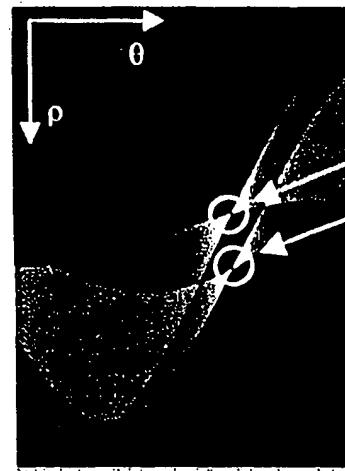




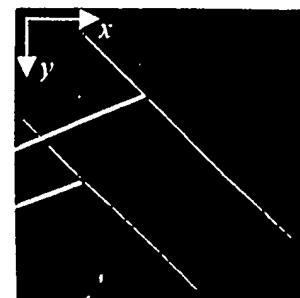
**FIG. 7A**



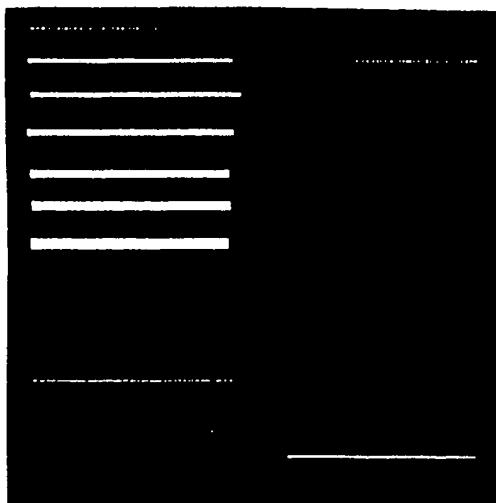
**FIG. 7B**



**FIG. 8A**



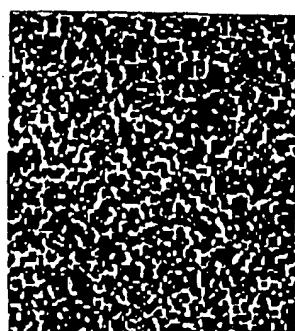
**FIG. 8B**



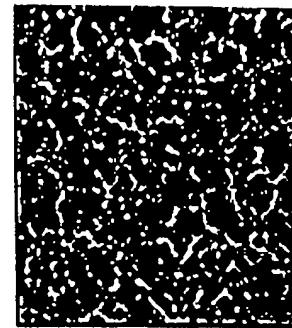
**FIG. 9**



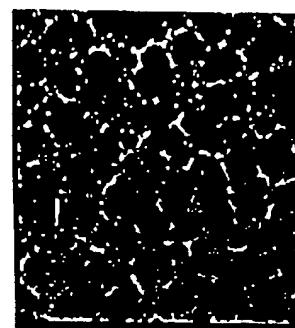
**FIG. 10A**



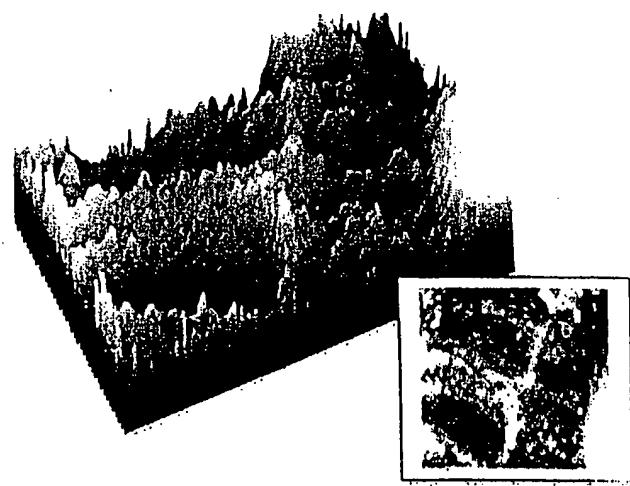
**FIG. 10B**



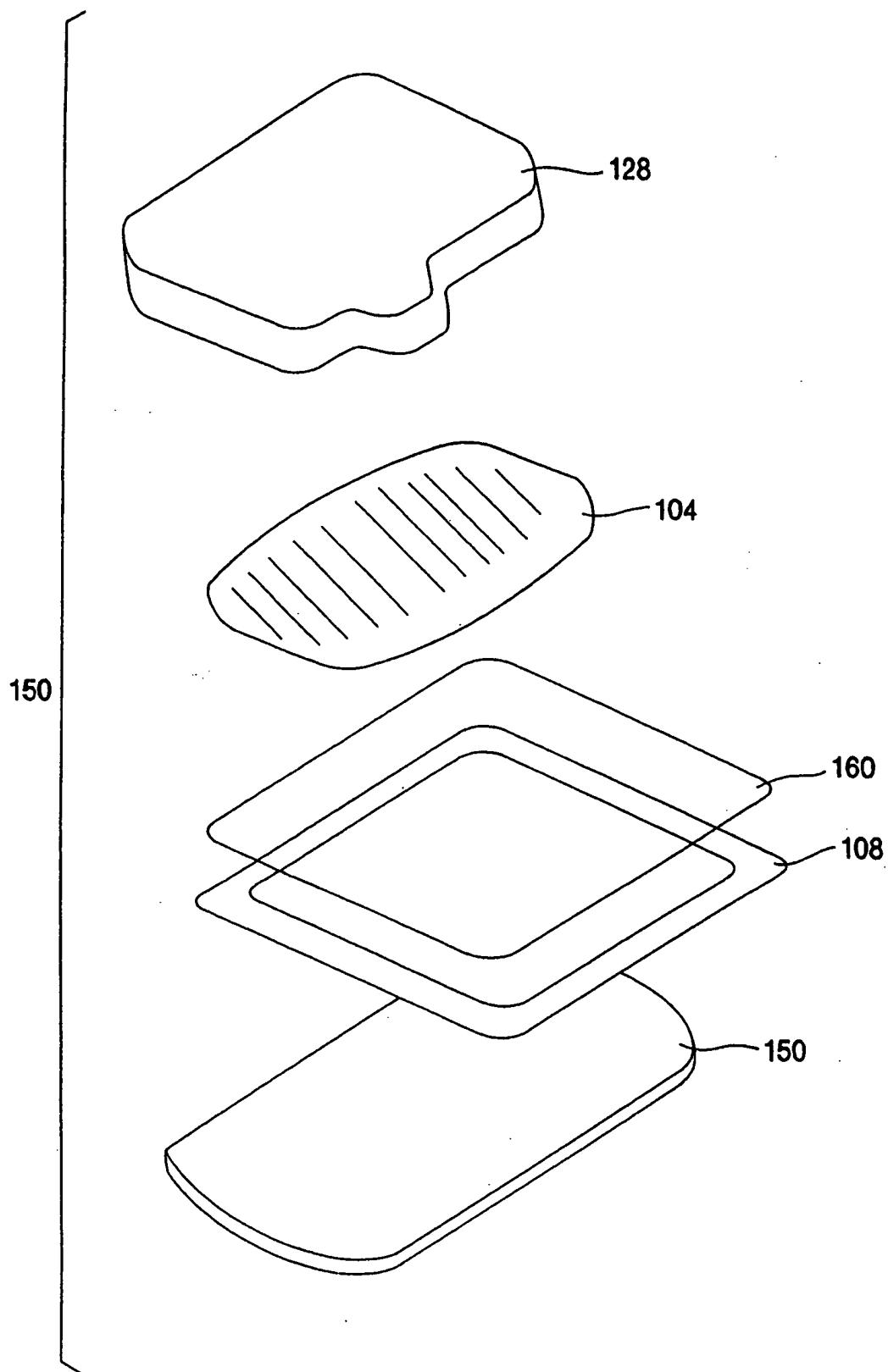
**FIG. 10C**



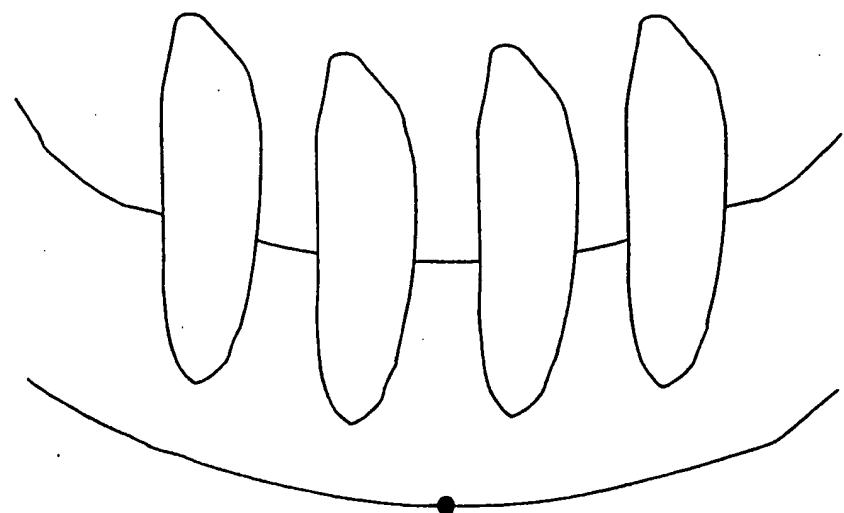
**FIG. 10D**



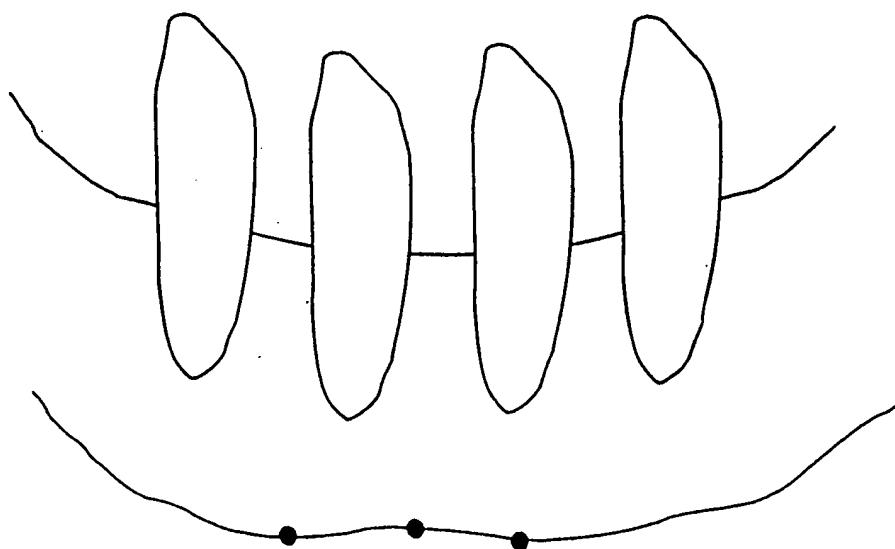
**FIG. 11**



**FIG. 12**



**FIG. 13**



**FIG. 14**

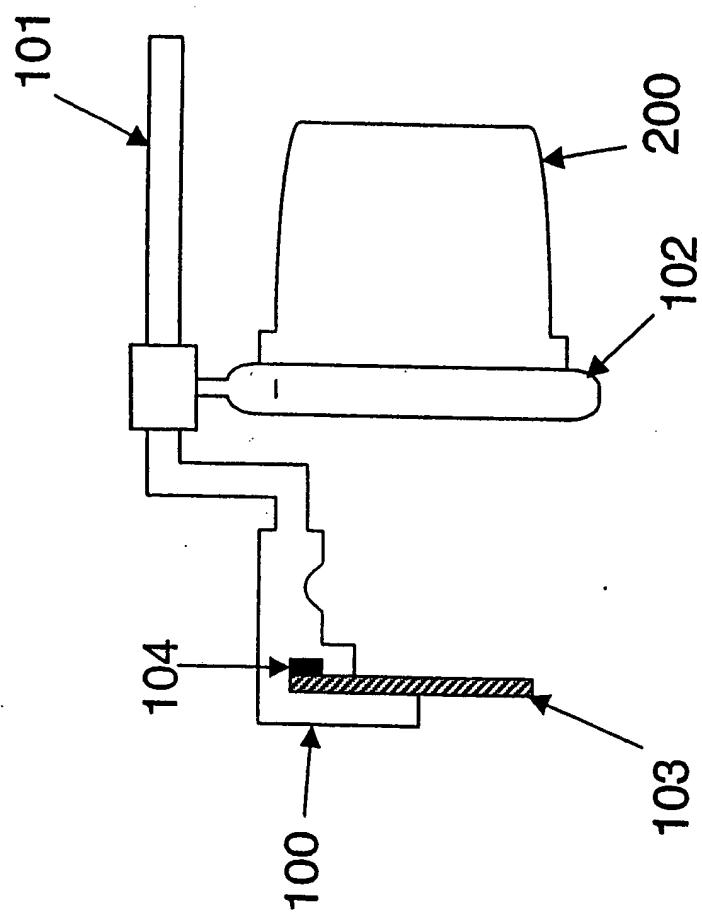


FIGURE 15

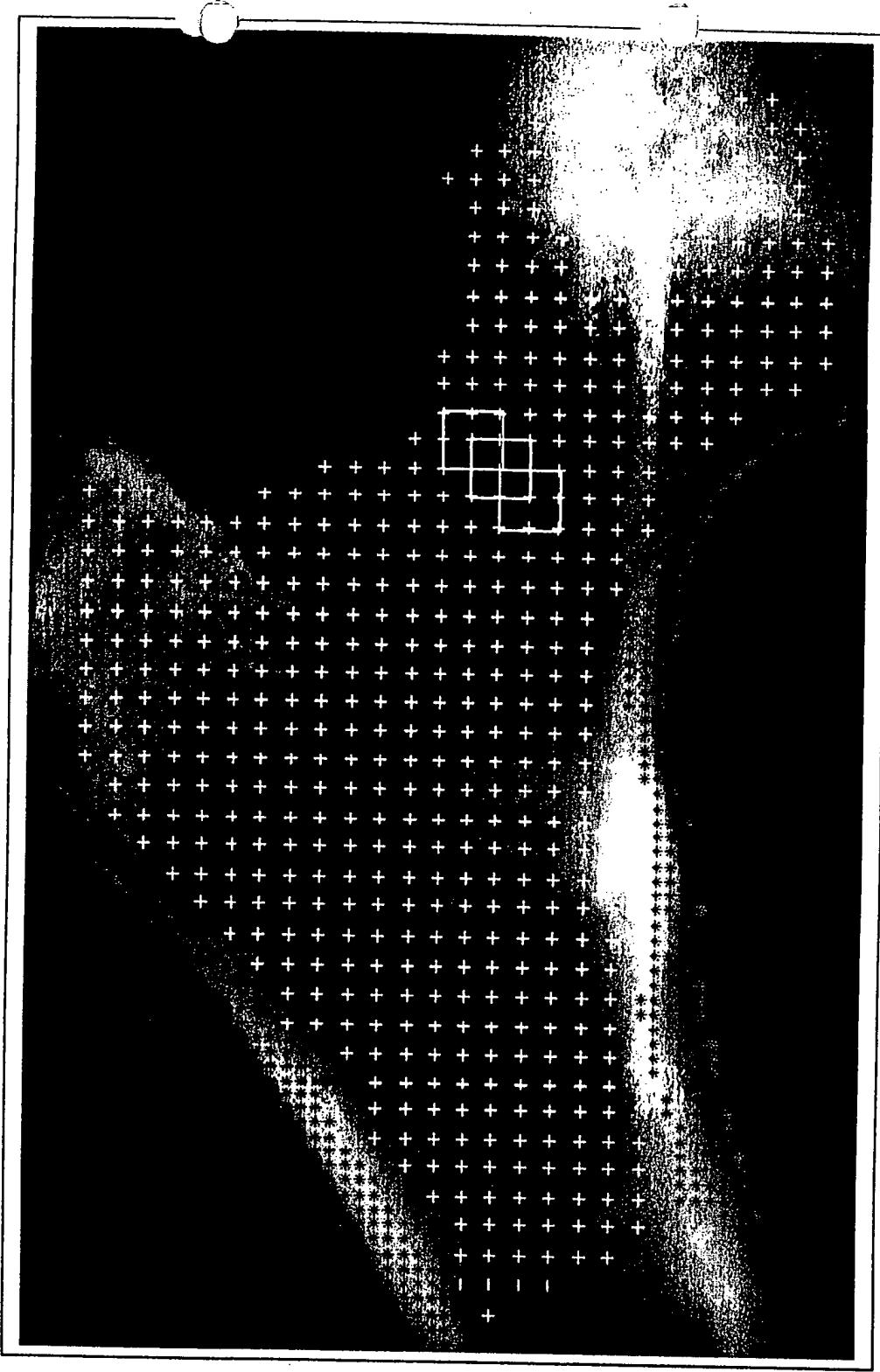


Figure 16. An example of a regular interval sampling field for microarchitecture (+) and a higher density sampling field for macro-anatomical features (\*) on a femur radiograph. White rectangles are examples of overlapping window positioning.

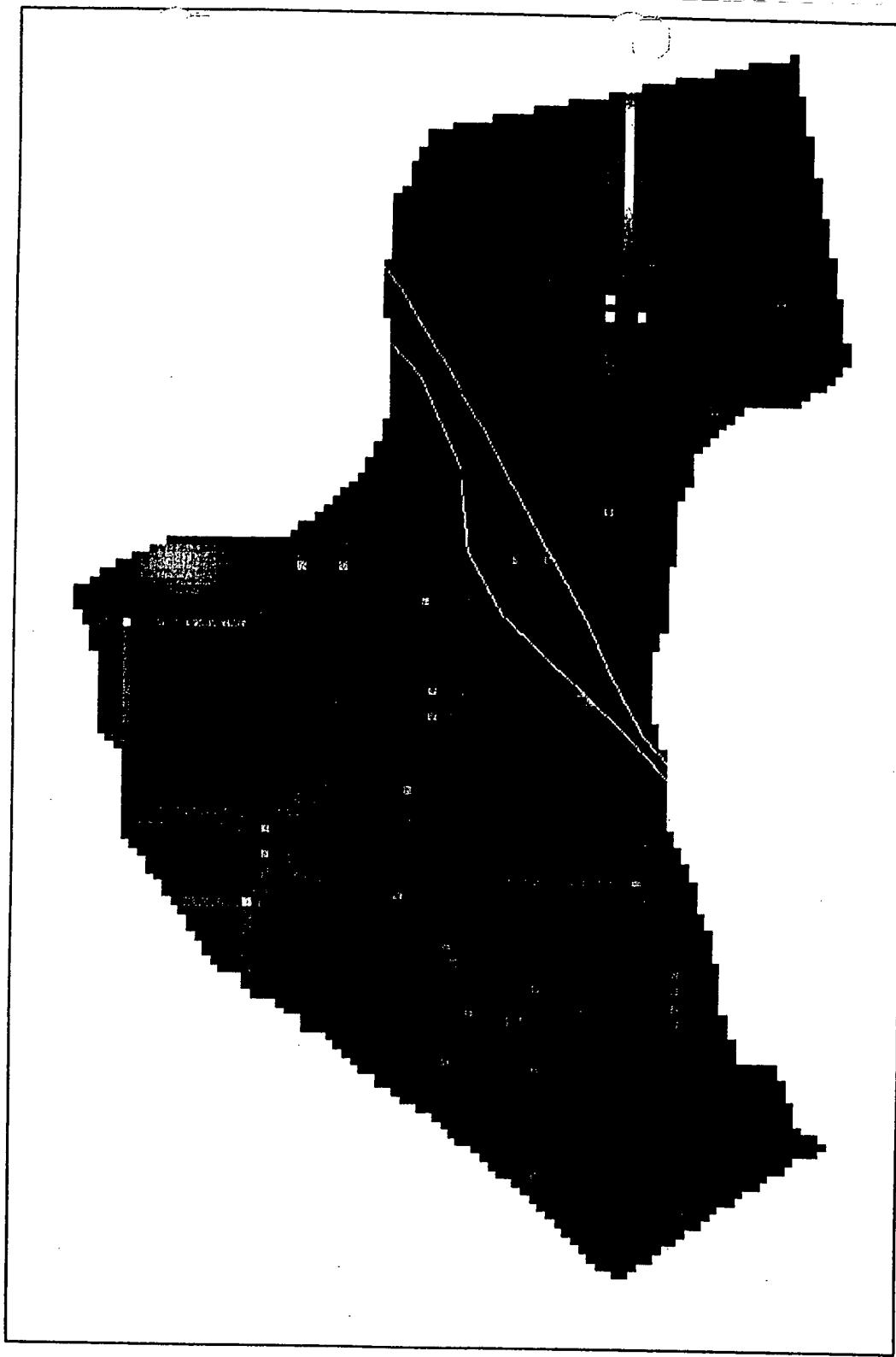


Figure 17. Watershed segmentation boundaries superimposed on a parameter map. The two white lines are the actual fracture paths resulted from an in-vitro mechanical loading test.

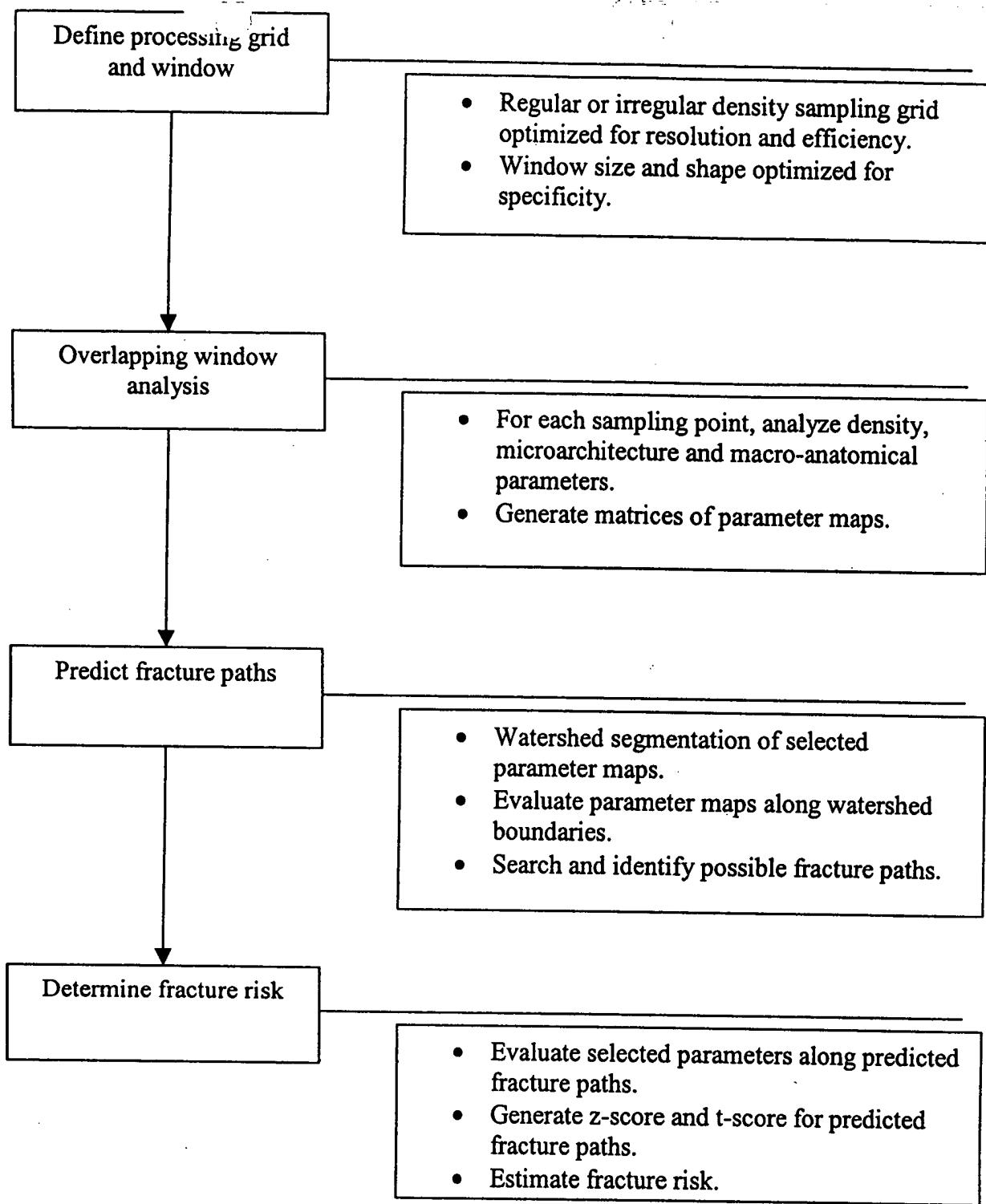
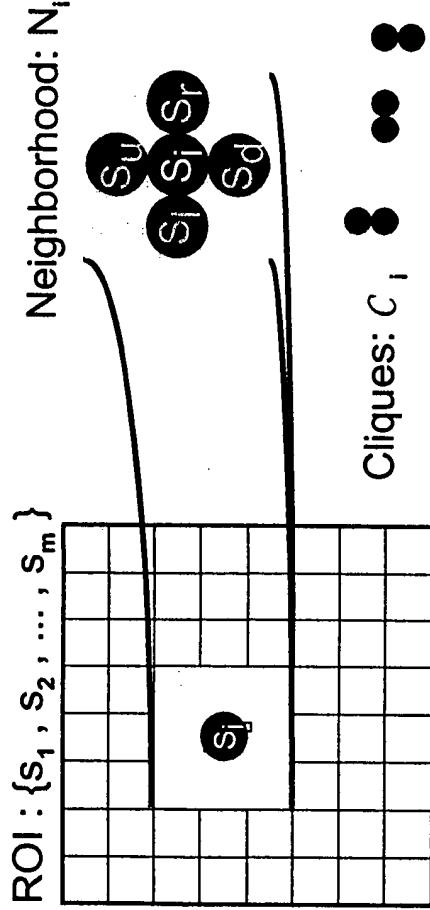


Figure 18. Process to determine fracture risk using overlapping window processing and fracture paths prediction.



Cliques:  $C_i = \{s_i, s_l, s_r, s_d\}$

$s_i : \{F1_i, F2_i, \dots, Fm_i\} \rightarrow$  feature set at site  $s_i$

Joint distribution of feature set given neighboring sets:

$$P(s_i | s_k, s_k \in ROI) = P(s_i | s_k, s_k \in N_i)$$

Figure 19

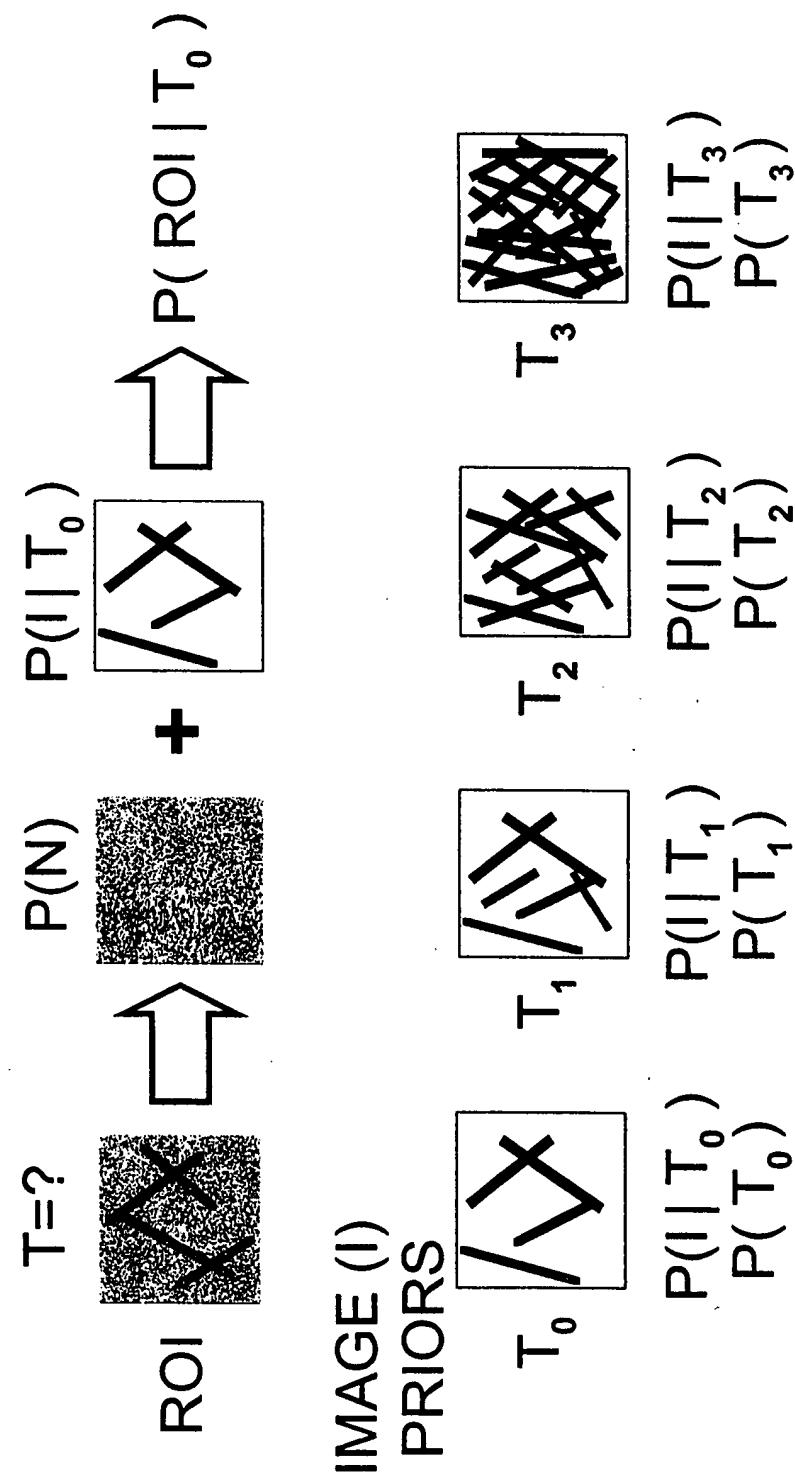


Figure 20

## A posteriori density distribution

$$P(T_i | ROI) = \frac{P(ROI | T_i) P(T_i)}{P(ROI)}$$

$\uparrow$

$P(T_i | ROI)$

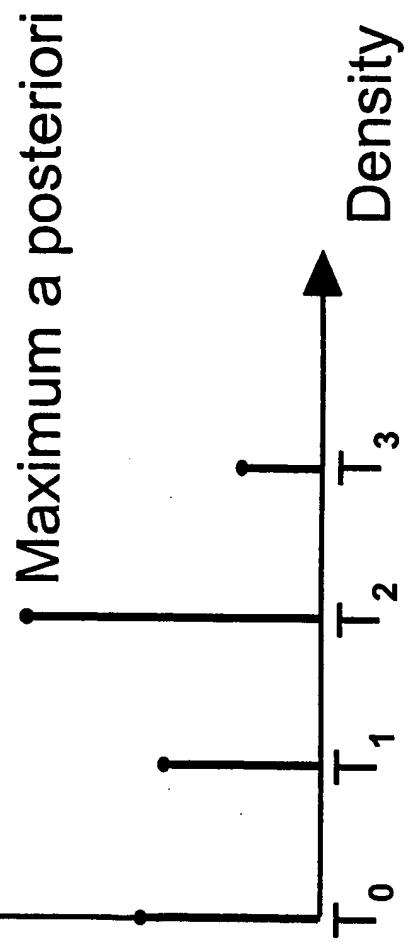


Figure 21

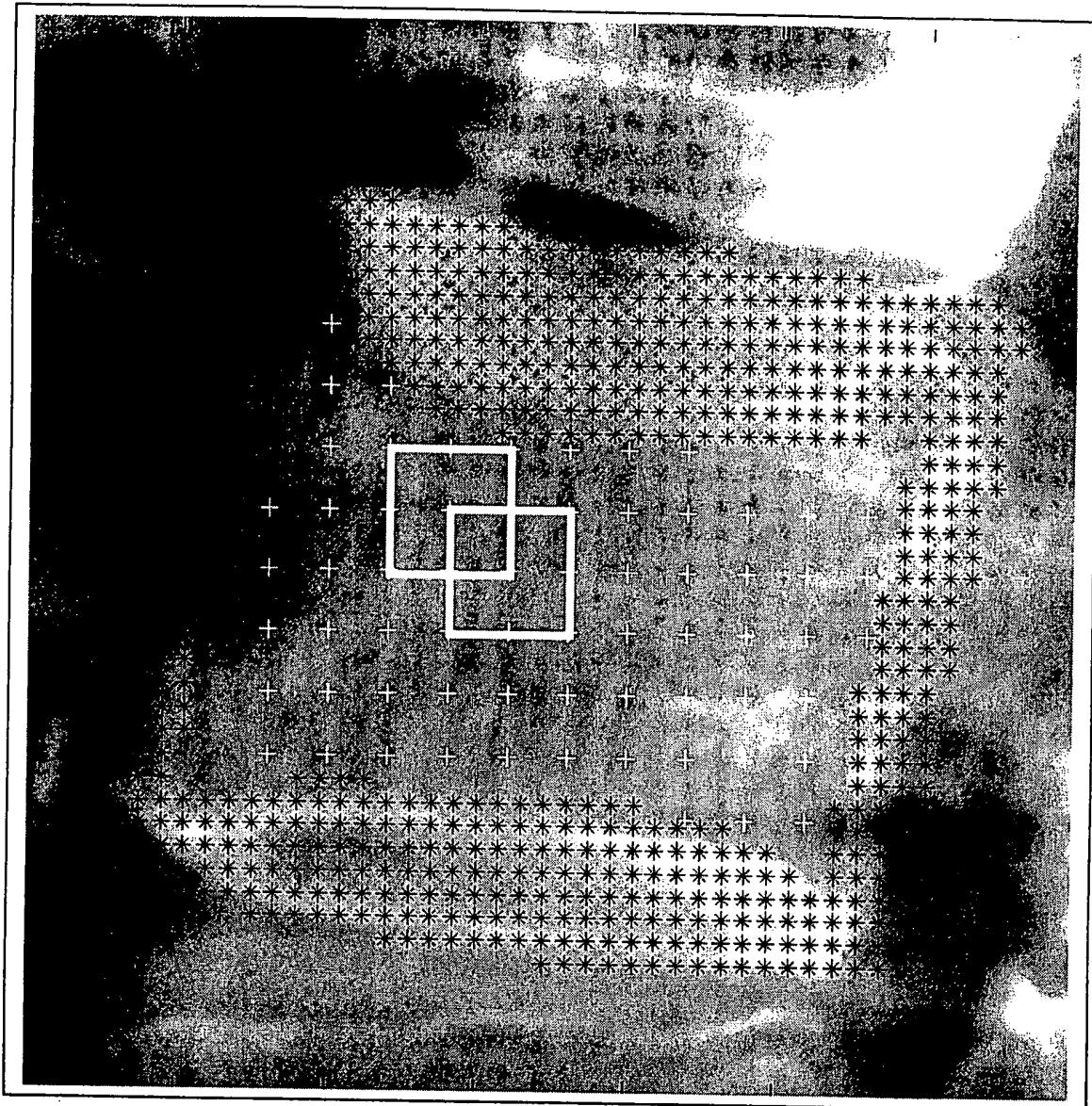


Figure 22

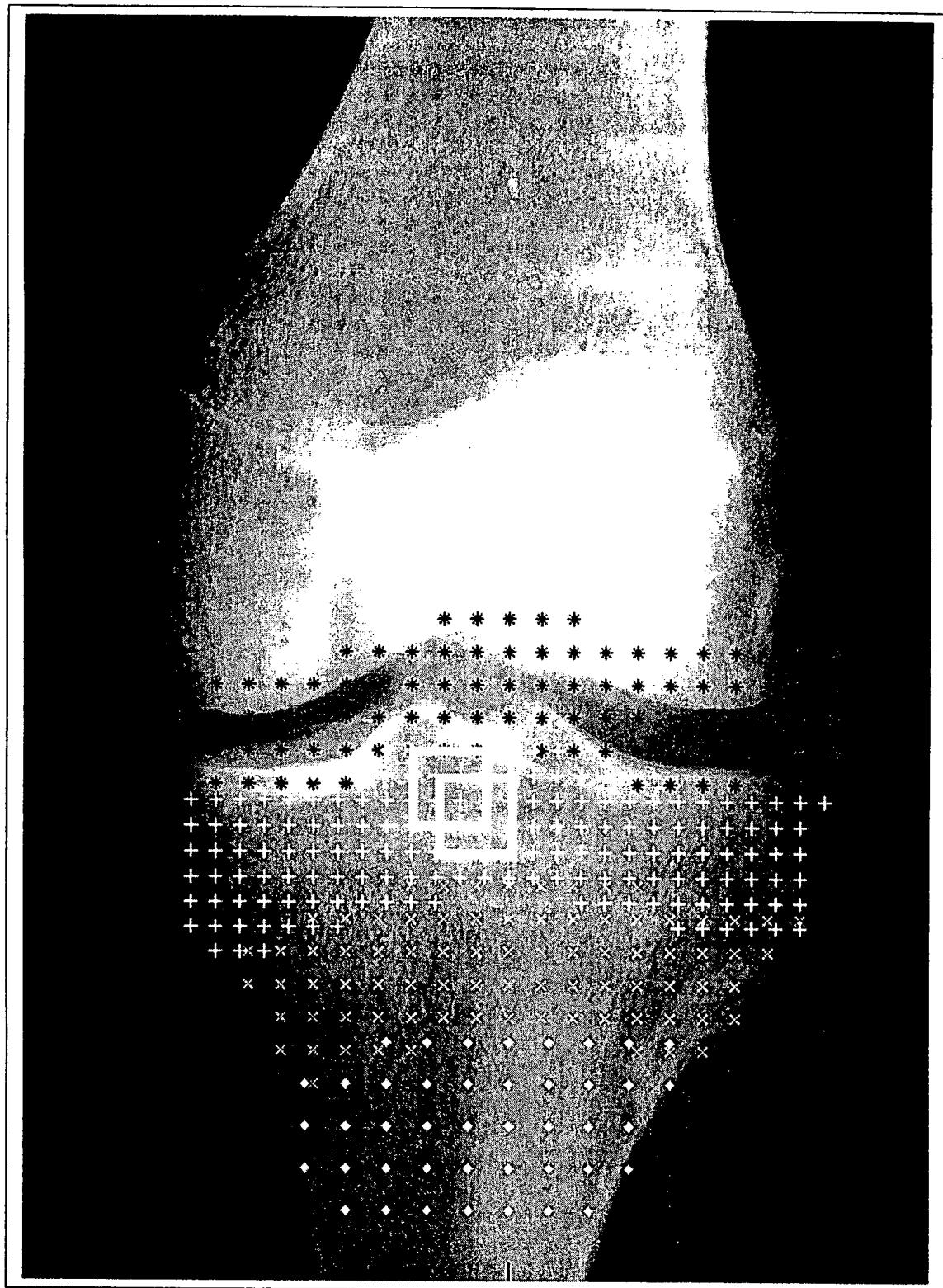
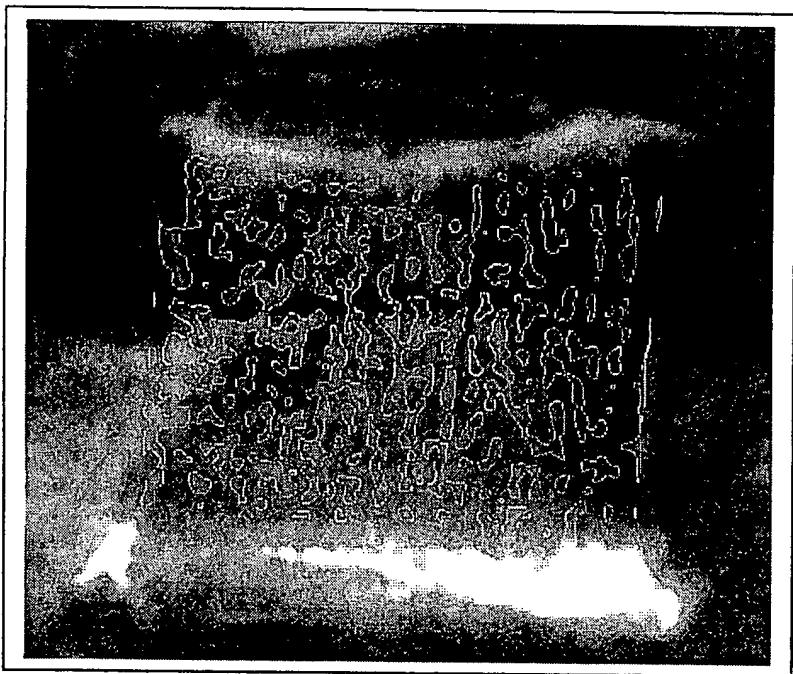


Figure 23



(a)



(b)

Figure 24